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Article

Rezo and German Climate Change Policy: The Influence of Networked Expertise on YouTube and Beyond

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Abstract
Just before the European election in May 2019 a YouTube video titled *The Destruction of the CDU* (Rezo, 2019a) caused political controversy in Germany. The video by the popular German YouTuber Rezo attacked the conservative Government party CDU (*Christlich Demokratische Union Deutschlands*) mainly for climate inaction. As a reaction to the subsequent attacks on Rezo and his video from the political establishment an alliance of popular German YouTubers formed to release a second video. In this video, the YouTubers asked their followers not to vote for the Government or the far-right parties, because they would ignore the expertise of scientists and the scientific consensus on anthropogenic climate change and therefore be unable to provide sustainable solutions for the future. This debate started as a YouTube phenomenon but quickly evolved into a national public discussion that took place across various social media channels, blogs, newspapers, and TV news, but also e.g., in discussions in schools, churches, as well as arts and cultural events. The focus of this contribution is on the formation of the heterogeneous coalition that emerged to defend and support the YouTubers. It prominently involved scientists and scientific expertise, but other forms of expertise and 'worlds of relevance' were also part of this coalition. The conceptual tools of 'networked expertise' and 'ethno-epistemic assemblages' are employed to explore expertise and credibility as well as the associations and networks of actors involved which illuminate how a single YouTuber was able to contribute to the unleashing of a national debate on climate change policy.

Keywords
climate change; controversy; Germany, global warming; influencers; networks; science communication; YouTube

Issue
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1. Introduction

Scientific and other forms of expertise are key resources in public health and science controversies. However, in general, there are various forms of relevant expertise in public controversies. Often they oppose one another and the way in which credibility and trustworthiness are assigned varies among the public. For a better understanding of this matter, Limoges (1993) offers a processual understanding of expertise in controversy contexts. Limoges describes controversies as 'controversist spaces' in which various actors and experts with completely different 'worlds of relevance' meet. For Limoges, all participating groups are fully-fledged actors in this space thus expertise per se does not count more than the view of any of the other involved actors and in most cases, expertise is provided in plural and often contradictory. In media coverage of debates, journalists generally mediate controversies and select the (expert) voices they think should be represented. This process, however, is less straightforward for public science and health controversies in the digital world as there are no gatekeepers and a great variety of new actors and experts struggling to have their voices heard.

Limoges asserts that the actual issue during a controversy is the negotiation of the associations established between the different 'worlds of relevance' mobilized by different participants. Such associations are not defined a priori but emerge as outcomes of the interactions between the participants. In other words, the representation of expertise develops through the course of controversies. How powerful and credible experts become in a controversy depends, in this view, on their ability to network and form associations.

In this view, the credibility of expertise needs to be developed within a controversy context and it is therefore not an individual but collective process. For Limoges, the credibility of expertise stems from the strengths of the networks that actors are associated with in the controversy. Expertise is, therefore, a collective learning process which provides actors and experts with credibility if they are successful in addressing the articulations of various 'worlds of relevance.' In this sense, expertise is a public process which creates the conditions of credibility of expert performance (Limoges, 1993).

This understanding of networked and collective forms of expertise in controversy contexts was further developed by Irwin and Michael (2003). They proposed the notion of ethno-epistemic assemblages as a heuristic tool with which heterogeneous groupings could be analysed. 'Epistemic' here refers to the production of truth or truth claims; 'ethno' connotes the idea of locality and situated-ness of knowledge; and the concept of 'assemblage' is used to grasp the interweaving of laypeople and experts (Irwin & Michael, 2003, pp. 119–120). These assemblages are not static, they are dynamic and processual, and different actors with a variety of background knowledge, expertise, and experience can join such groups. This concept is proposed for a better understanding of the way in which controversy, debate, and negotiation are played out in public. Instead of struggles conducted between experts and (lay) publics, Irwin and Michael (2003) propose that struggles over truth claims are conducted between assemblages made up of different combinations of experts and publics. The concept of ethno-epistemic assemblages, therefore, blurs the boundaries between experts and non-experts but also between public, government and governance, as well as between science and society.

In this contribution, I offer a close reading of a public controversy about climate change policy that was initiated by, and mainly revolved around, a YouTube video released by the popular German YouTuber Rezo in May 2019 (Rezo, 2019a). This video mainly attacks the failing climate policy of the German government and has received national and international attention. In this interpretative account, I use the perspective of networked forms of expertise and ethno-epistemic assemblages as introduced by Limoges (1993) and Irwin and Michael (2003) to analyse the 'controversist space' of the public debate and how various forms of expertise formed networks and worlds of relevance which became enrolled and connected in the unfolding debate. My account is based on an online ethnographical approach following the Rezo video and the subsequent debate through various digital spaces (social media platforms such as YouTube and Twitter, online news sites and blogs) from May 18, 2019, to January 31, 2020. In this process, key documents of the debate were selected and archived for further analysis and a chronological archive of YouTube videos and comments, Tweets, blog entries, and news articles were created, which serve as the basis of my interpretative account.

2. YouTube and Science Communication

YouTube is extremely popular in Germany. A representative study (Rat für kulturelle Bildung, 2019) among young citizens in Germany has found that 86% of youths between 12 and 19 years use YouTube and that 93% of youths between 18 and 19 years in Germany use YouTube for entertainment, information, and education. 91% of young people questioned said that it is very important what their friends recommend watching on YouTube. 65% of the young people questioned also follow recommendations from YouTube influencers. Such influencers are particularly influential among the 12–15 age group (Rat für kulturelle Bildung, 2019).

Another representative study on the use of online media among young people in Germany has found that the use of YouTube has further increased in recent years (Medienpädagogischer Forschungsverbund Südwest, 2019). While in 2016, 42% of young people questioned said that they used YouTube daily or almost daily in 2018, 60% of the respondents said that they used the site daily or at least several times a week. YouTube has become one of the most popular Internet sites in Germany for all age groups. The study also investigated information and knowledge seeking behaviour online and found that YouTube is the second most popular site for acquiring knowledge and information after Google. Also, more young people search for things they want to know via YouTube rather than the online encyclopaedia Wikipedia (Medienpädagogischer Forschungsverbund Südwest, 2019).

This is also the case when it comes to science, technology, and research—not just among young people. A German representative study on science and research in society (Wissenschaft im Dialog, 2015) found that more than two thirds (69%) of young people questioned between 14 and 29 years said they use YouTube (and other online video platforms) to get information about science and research. Among those between 30 and 39 years, still more than half (55%) said the same and among those between 40 and 49 years, it is almost half (46%) who are informed via YouTube.

So far, little research has been done to systematically investigate science and research topics on YouTube (Allgaier, 2018; León & Bourk, 2018). There are some methodological problems that need to be overcome. For

instance, the algorithmic curation and personalization of search results (e.g., Rieder, Matamoros-Fernandez, & Coromina, 2018) make reliably sampling video content difficult. However, there is a great deal of potential for public science and health communication via the online video format, since it allows for the use of lots of different audiovisual elements as well as text, and subtitles in different languages (e.g., Allgaier & Svalastog, 2015; Körkel & Hoppenhaus, 2016; León & Bourk, 2018). Luzon (2019, p. 170) asserts that "online science videos are multimodal texts which draw on several modes or semiotic resources (e.g., non-verbal sound, spoken and written language, image) to re-contextualize scientific discourse." This re-contextualization can be used to bridge knowledge gaps between scientific experts and the general public (Erviti & Stengler, 2016; Luzon, 2019). But there is also a dark side. Analyses of scientific video content on YouTube have found that users are directed to biased and defective video content and conspiracy theories when they are searching for biomedical or scientific information. Some examples are topics such as vaccines (Basch & Basch, 2020; Basch, Basch, Zybert, & Reeves, 2017; Venkatraman, Garg, & Kumar, 2015), Ebola (Allgaier & Svalastog, 2015; Basch, Basch, Ruggles, & Hammond, 2015), the Zika Virus (Basch, Fung et al., 2017), climate change and geoengineering (Allgaier, 2019), and the question of whether the Earth is flat (Landrum, Olshansky, & Richards, 2019).

Another gap in the literature concerns the production of content. Very little is known so far about who is successfully communicating science and research on these sites and with what intentions various actors use YouTube to communicate science (Flores & de Medeiros, 2019). In social media research, it has been a convention to differentiate between professionally generated content and user-generated content (e.g., Kim, 2012). Research by Welbourne and Grant (2016) has shown that science videos made by professional media organizations outnumbered the videos made by users when the research was conducted. However, it was also found that the content produced by the users is more popular and has been viewed much more often than the videos created by professional media organizations (Welbourne & Grant, 2016).

Morcillo, Czurda, and Robertson-von Trotha (2016) described how science videos created and shared by the users are made of high cinematographic quality and are also immensely creative. The 'amateur users' created new visual languages and also new genres and formats for the successful public communication of science. In their videos, charismatic hosts present science in innovative and creative new ways and have also developed science-related storytelling that is enjoyed by large audiences. They often use humour and emotion in their science videos and the contents are often heavily personalized. Science and other YouTubers generally present themselves as authentic and amenable persons who avoid jargon and often use vernacular language. By that, they often want to show that they are close to their viewers and everyday people and make the experience of watching a YouTube video more relatable (Holland, 2017).

Recent research from Germany has found that Science YouTubers produced and shared the majority of the science videos in a sample of 400 science videos on YouTube in German language (Bucher, Boy, & Christ, 2019). These independent science communicators outnumbered the contributions coming from research institutions and universities and also received far more views than the contributions of scientific organizations and institutions. The most successful science YouTubers now have many millions of subscribers.

Video-sharing via YouTube, in general, has become far more professionalized and commercial in recent years. Most content creators on YouTube try to monetize their video content and many of them are organized in multichannel networks that help them with marketing, potential advertisers, and sponsors (Frühbrodt & Floren, 2019). All successful creators on YouTube need to play along with the platform-specific rules in order to be visible. How YouTube's ranking and curating algorithms highlight some contents and neglect others is not transparent and also changes with time (e.g., Geipel, 2018). Further research is needed to fully understand the platform-specific logics and laws, but Van Es (2019) describes the operating logic of YouTube as being commercially driven, for instance by selling personally targeted advertising space. Here, the YouTube algorithms have different functions: They control what is allowed on the platform, they determine the extent to which a video is integrated into the recommendation system, and the algorithmic control also decides whether a video is eligible for remuneration for advertising. In this sense, the black-boxed YouTube algorithms have a strong influence on the communications and work of YouTubers, and they also act on the relationships among users, creators, advertisers, and the platform itself (Arthurs, Drakopoulou, & Gandini, 2018; Bishop, 2018). However, YouTubers who create science videos have the advantage that videos about science topics generally do not depend strongly on real-world events in contrast to, for instance, current or political affairs topics and videos.

A simple dichotomous distinction between user-generated content and professionally created content is no longer adequate to explain what is happening on YouTube today. Previous amateurs, such as the (science) YouTubers, have now become more successful on YouTube than many of the previous media and communication experts from traditional media organizations by reaching wider audiences (Morcillo, Czurda, Geipel, & Robertson-von Trotha, 2019). To be successful on YouTube also means elaborate community management (e.g., Erviti & Stengler, 2016). Successful YouTubers, therefore, spend a significant amount of time with parasocial interactions; they respond to comments, engage in dialogue with their viewers and personally deal with

requests, ideas, and suggestions (Rihl & Wegener, 2019). In this way, they are often quite service-oriented, for instance when they ask their viewers what the next video should be about. In this sense, they use a very dialogic approach and also encourage their viewers to comment on their videos and to discuss them.

Breuer (2012) argues that 'authenticity' is an important if not the central currency on platforms such as YouTube and is often linked to credibility. To be authentic also means to be perceived as a real, honest, and tangible person whom users can relate to. Authenticity is often linked with amenability, which increases if the users feel that they are taken seriously by the content creators. This can involve, for instance, personal replies to their questions or comments or being personally mentioned in videos. Research on social media influencers has stressed the importance of authenticity (e.g., Abidin & Ots, 2016) and also the role of emotion (e.g., Sampson, Maddison, & Ellis, 2018) in social media communications. Recent research by Reif, Kneisel, Schäfer, and Taddicken (2020) highlights the importance of considering emotions when studying trustworthiness, especially in the context of public science communication. In the community of YouTube users, dialogue and interaction are highly valued. Individuals, organizations and institutions that are not responsive on YouTube are often not perceived as being trustworthy or authentic and therefore not of interest to many YouTube users. Transparency is another important issue for many science and other YouTubers, e.g., for establishing trust. This means, for instance, making the sources used in videos transparent and directly linking to relevant sources and materials in the videos' descriptions (e.g., Delattre, 2017).

3. The Public Debate about Rezo and His *The Destruction of the CDU* Video

3.1. The Rezo Video on YouTube

Rezo is a popular German YouTuber based in the university town Aachen. The male YouTuber has a degree in computer science, is known for his trademark blue hair and withholds his official name from the public (Wikipedia, 2020a). By posting funny clips and videos about music on his two YouTube channels he has built himself a large base of followers and subscribers and has gained a reputation in the German YouTube scene. On May 18, 2019, he posted an unusually long video which lasted almost an hour (54 minutes and 57 seconds). The video is titled *The Destruction of the CDU* (Rezo, 2019a). The CDU (*Christlich Demokratische Union Deutschlands*) is the conservative governing party of Germany's Chancellor Angela Merkel. Right at the beginning of the video, the YouTuber makes it clear that destruction in this sense is only meant metaphorically. He moves on to explain that it is the purpose of the video to present reasons and proof why the governing party actually de-legitimizes itself with its own politics, or in other words that it does not practice the values it claims to uphold. He does not exclusively take a swipe at the conservative governing party, but also at the party of the Social Democrats (SPD, *Sozialdemokratische Partei Deutschlands*), which forms a coalition government with the CDU in Germany.

In the video, Rezo attacks various policies of the governing parties, but the largest and main part of the video criticises the government's climate policy. He explains that there is a consensus among scientists that humans are the cause of climate change and describes his frustration and disappointment that the government does not act according to the advice of climate scientists concerning climate change. He portrays climate change as a serious threat to the wellbeing of humanity and all other forms of life on the planet. Rezo describes some of the scenarios of what is likely to happen, if climate emissions are not curbed very soon based on scientific assessments, such as the ones from the Intergovernmental Panel on Climate Change and stresses that, according to the scientists, there is no going back once certain levels of climate change have been reached. Among others, he explains global warming and the global consequences of rising temperatures and he also portrays likely consequences of the loss of biodiversity through climate change, harmful effects on public health, food security, and increased global migration as a result of climate change.

The video is a complaint, an arraignment, and a manifesto for curbing climate emission, the transition to sustainable energy systems, carbon taxing, and a plea for a scientific assessment of the climate crisis. In order to make his sources transparent, there is a link in the description of the video to a 13-page Google document (Rezo, 2019b) listing all the sources he refers to in the video (99 of the references in the document refer to the debate around climate change). In the section concerning climate change, he mainly refers to scientific publications in scientific journals such as *Science*, *Nature*, *Environmental Research Letters*, *Atmospheric Chemistry and Physics*, *Nature Climate Change*, *The Lancet*, *Proceedings of the National Academy of Science*, or *The Royal Society (Philosophical Transactions A*), and scientific assessment reports, for instance, by the Intergovernmental Panel on Climate Change or the Intergovernmental Platform on Biodiversity and Ecosystem Services.

In the video, Rezo (2019a) is seen talking, filmed from the front, wearing an orange hoodie, and while he is talking subtitles refer to the sources laid out in the appendix document. Occasionally a graph or an image appears on the screen to visualize what he is explaining. The way he is talking differentiates him from a news anchor or academic expert; he is using a youthful and vernacular language that other people of his age use when they have conversations among friends in a pub. His language is not neutral in tone, he also shows verbally and by facial expressions and gestures that he is shocked about the gloomy scenarios put forth by the scientists and angry

that the government is not reacting appropriately, given the advice coming from scientific experts. However, Rezo follows a structured argumentation line and points out in detail how the government is failing in addressing the climate crisis (before he moves on to talk about social policy issues).

3.2. The Social and Political Context

The video was posted on YouTube roughly a week before the European elections took place in Germany on May 26, 2019. In the video, he calls on his predominantly young followers to participate in the European elections, but to vote for neither the CDU nor the SPD and particularly not the far-right AfD (*Alternative für Deutschland*). From his point of view, none of the three parties would provide any real sustainable solution for dealing with climate change—and the AfD would not even acknowledge that anthropogenic climate change is happening. In the description of the video it reads in German:

> The European election is taking place very soon. In this video, I try to answer the question of whether the CDU, SPD, or AfD are good parties that are in harmony with science and logic. In any case: Go to vote next weekend. If not, pensioners will decide on your future and that is not cool at all. (Rezo, 2019a, author's translation)

Within a day, the video had more than one million views and all major German news outlets reported on it over the following days. By election day, Rezo's video had been viewed more than 11 million times and reviewed in international news outlets such as *Le Figaro*, *The Guardian*, and *The New York Times*. Meanwhile, a German Wikipedia entry was also made (Wikipedia, 2020b) about the impactful video and its reception in politics, media, science, and society, which also linked to key documents. By the end of the year, *The Destruction of the CDU* video was the most-watched German online video of 2019, receiving more than 16 million views (Wikipedia, 2020b).

Immediately after the video had been reported in the news, politicians of the conservative governing party heavily attacked the YouTuber for spreading false information and fake news (e.g., "Germany's CDU slams YouTuber Rezo," 2019). CDU then announced that it would react in the form of their own response video. However, shortly after that, the conservative party then announced on its website (CDU, 2019) that a response video would not be the communicative style of a grand national party and instead released an 11-page document, in which it tried to refute Rezo's claims.

3.3. Aftermath of the Video

Soon after the video was released, various scientists entered the scene, such as the influential female science communicator Mai Thi Nguyen-Kim. She quickly produced a video (maiLab, 2019a) on her YouTube channel 'maiLab' to check the scientific facts presented in Rezo's work. Apart from some minor inaccuracies she scientifically approved the content of Rezo's video as well as his call for immediate action. The maiLab video also features the comedian and physician Eckhard von Hirschhausen, who is very popular and well-known for hosting various health and science programs on German television and other public events. In the video, he is also supportive of Rezo's claims.

Some days later Stefan Rahmstorf (2019), Professor for Physics of the Oceans at the University of Potsdam and Head of Earth System Analysis at the Potsdam Institute for Climate Impact Research, and Volker Quaschning (2019), Professor for Regenerative Energy Systems at HTW Berlin University of Applied Sciences checked the scientific facts presented in the Rezo video, as well as in the written response of the CDU and both also backed the claims that Rezo made in the video. Quaschning writes that he did not find any proofs in the response of the CDU that would substantially disprove the claims made in Rezo's video concerning climate change. Physicist Christian Thomsen, President of the Technical University of Berlin, also backed Rezo's claims and states in an opinion piece (Thomsen, 2019) that Rezo (and other involved YouTubers) had cited references more correctly and transparently than many of the Federal Ministers and professional politicians who were attacking him. Rezo not only received backing from scientists and other experts, but also from many citizens, religious institutions (Oster, 2019), and influential people from the arts and culture community, such as the director Thomas Oberender (2019).

Meanwhile, Rezo had teamed up with further influential players in the German YouTube scene. On May 24, 2019, two days before election day, an alliance of over 70 highly popular German YouTubers released another video (Rezo, 2019c), which they simply named *A Statement of 70+ YouTubers*. This video was less than three minutes long and contained a single statement issued by a very diverse set of YouTubers. The YouTubers featured in this video normally have differing points of foci, such as music, beauty, fashion, gaming, as well as a range of other subjects. Very few of them had been making videos about science-related topics up until that point. A statement posted underneath the video was later signed by more than 90 highly popular German YouTubers.

In their video statement, the YouTubers called on their followers to vote in the European elections, but not to vote for the governing parties or the right-wing AfD, because none of them would follow scientific advice on climate change. The YouTube creators explicitly aligned themselves with the scientific experts and also referred to the work of the Intergovernmental Panel on Climate Change (Rezo, 2019c) and a statement signed by over 26,000 scientists and scholars from Germany, Austria,

and Switzerland (Scientists for Future, 2019). This statement explained that the governments of the three countries were not doing enough to limit global warming, to halt the mass extinction of animal and plant species, or to preserve the natural world upon which life depends. Taken together, this group of YouTubers has millions of followers. This video also made national headlines (e.g., "German YouTubers," 2019) and was viewed almost 3 million times just within the first two days.

This alliance of YouTubers was also heavily attacked and criticized by various members of the conservative governing party. The biggest winner in the German election was the Green Party (Wikipedia, 2020b), receiving more than a third of first-time voters votes. The governing coalition experienced massive losses and the German public-service television suggested that the 'Rezo-effect' had helped the Green party; with this, climate protection had become a major topic in the EU elections (Wikipedia, 2020b).

The massive gain in the share of votes by the Green Party in the European election was not a result of the YouTube videos alone. There is no data-based evidence that a 'Rezo-effect' had taken place in the election. Nonetheless, various news articles and blogs claimed that the two videos had influenced the results of the election. Conspiracy theories emerged on the web suggesting that the Rezo video had been instigated by the Green party—although this was later disproved by journalists (Wikipedia, 2020b). Rezo claimed in various interviews that he made the video himself and had spent hundreds of hours working through the scientific material. He felt that it was his duty as an informed citizen to criticize the Government for its inaction and he also de-monetized the video to show that he was not aiming to profit financially from it. To understand the potential impact of the video it is important to have a look at the wider social and political context, in which the video emerged: Many young voters in Germany already held grudges against the government because their protests against Article 13 of the draft EU Copyright Directive (which would require Internet platforms like YouTube to filter out copyrighted video content) were ridiculed by some conservative politicians shortly before the video (e.g., Stojanovski, 2019). Also, the enduring wave of nation-wide Fridays for Future demonstrations, inspired by the climate protection activist Greta Thunberg, had not been taken seriously by the government (e.g., "EU election," 2019). Instead of responding to the questions and concerns raised by young people about climate protection and sustainable plans for the future, Annegret Kramp-Karrenbauer, leader of the conservatives, proposed having a debate on the regulation of political views on the Internet during election campaigns (e.g., "Germany's AKK," 2019). This led to further furious debates and a petition campaign against the censorship of free speech on the Internet ("YouTubers petition," 2019).

German Chancellor Angela Merkel remained silent during this debate. Almost a month passed until she first spoke out on the issue, on June 19, 2019. In a discussion (Tagesschau, 2019) with about 200 teenagers in Goslar, she said that she was not happy with the defensive reaction of her party when the Rezo video first appeared. When the young people asked her if she thought there were points that Rezo got right in his video she responded that he was right that the government had indeed broken its promise on climate protection. The government then promised to assemble a task force on climate change in the autumn.

Five days before the newly assembled climate expert commission of the German government met and the third global climate strike took place on September 20, 2019, YouTube scientist Mai Thi Nguyen-Kim and Rezo together released another video (maiLab, 2019b) in order to mobilize people for the climate strike and to influence politicians' decision on pricing carbon. The 26-minute video presented scientifically approved solutions about how CO_2 emission pricing could help to solve the climate crisis. The video prominently featured economics professor Ottmar Edenhofer and engineer Klaus Russell-Wells, who runs a YouTube channel focused on energy transition and sustainability (Joul, 2020).

When the 'climate cabinet' of the government had presented a working plan about carbon pricing that scientific commentators described as a disappointment, Mai Thi Nguyen-Kim quickly produced another video (maiLab, 2019c), published September 23, 2019, in which she explained in drastic words why the proposed solutions would not be effective from a scientific point of view and why the government had still failed to address the climate crisis in a sustainable manner. This video also featured a rant about the government's failure by Harald Lesch, professor of astrophysics at the University of Munich, a public intellectual and popular German science communicator on TV, radio, and on various online platforms.

From October 24, 2019, onwards, Rezo has had a regular column in the elite weekly newspaper *Die Zeit*, in which he writes about social and political topics (Wikipedia, 2020a). He has been invited to join panels, talk shows and discussion forums, and in November 2019 he won, among other awards, the environmental media award for his *The Destruction of the CDU* video (Rezo, 2019a; Wikipedia, 2020a). In an interview in the weekly news magazine *Der Spiegel*, he was asked about the new government legislation about climate protection and he said: "It does not matter if I think it is sufficient. I am not an expert. It is important what the scientists say. And they say: The new legislation is not sufficient" (Kühn, 2020, author's translation). In April 2020, Rezo was also awarded the Nannen Award in the web project category for his YouTube video *The Destruction of the CDU*. The Nannen Award is the most prestigious prize for journalism in Germany, although the decision was considered controversial among journalists (e.g., Singer, 2020).

4. Discussion

4.1. Rezo, Networked Expertise and Ethno-Epistemic Assemblages

The perspectives of networked expertise (Limoges, 1993) and ethno-epistemic assemblages (Irwin & Michael, 2003) are helpful conceptual tools to better understand how a young blue-haired person could contribute to the unleashing of a societal debate over climate protection and anthropogenic climate change which went on for many months. The content of Rezo's video was not only discussed in journalistic media and social media platforms but e.g., also in schools, where many teachers showed the video in class and discussed climate change and politics with their students (e.g., Rezo, 2019d).

Over the years, Rezo was able to develop specific expertise concerning successful social media communication and interaction (not only on YouTube but also via other social media channels). An important resource is his large base of followers that he is able to address and also his very good contacts and connections in the German YouTube scene (Ziewiecki & Schwemmer, 2019). Rezo had received academic training at a technical university so he is able to actually process information from scientific sources himself (Wikipedia, 2020a). Over the years, he has learned how to present himself successfully on YouTube, but also how information needs to be presented so that it reaches an audience on this platform. He mentioned in various interviews how important it was for him to make all sources transparent that he used and that it took him a lot of time to work through all the material himself. The main achievement of the video is that it was able to translate and present the scientific content so that its target audience could personally relate to it. This is where scientists and institutional science communicators had failed. None of the content presented in the video was new—it was *how* it was presented that made it so impactful. Here, the use of a jargon-free colloquial language was very important, but also the fact that he was emotionally and wholeheartedly engaged in talking about an issue that was obviously a personal matter of concern. A certain amount of rage and indignation towards the government in the video together with the provocative call for all his followers to not vote for the established government parties were also very helpful in this regard. Reif et al. (2020) have highlighted the importance of considering emotions for the perception of trustworthiness, particularly in the science communication context.

Many of his followers most likely already perceived him as an authentic, relatable, and credible person, which might have been an important reason why so many young people watched his video in the first place. At some point, the YouTube algorithm also became an ally (although it is not entirely transparent how it functions). In May 2019, the Rezo video was trending and recommended to German users on YouTube. Soon after that, it was also recommended by the algorithms of other social media platforms, such as Facebook, Instagram, and Twitter, since many users had used these platforms to share or discuss the video. Various additional factors then further amplified the video, such as the fact that the general news media reported it and politicians had reacted to it, making it even more newsworthy in journalistic outlets, adding further 'worlds of relevance.'

When Rezo teamed up with the heterogeneous network of YouTubers his statement also reached many young people who had not been following his channel but those of the other YouTubers, channels with entirely different target audiences than Rezo's. Very quickly scientists jumped on the bandwagon and further helped to make the video known within their spheres of influence. This association lent scientific credibility to the network that had formed around the Rezo video. The videos from maiLab were particularly important for adding credibility in various further 'worlds of relevance' and her connections with other YouTubers, journalistic media, and celebrity science communicators further amplified the reach of the videos. Various other YouTubers, who had not been involved until that point, then also pushed Rezo's videos via their own channels. In addition, a variety of further actors from entirely different social spheres and 'worlds of relevance,' such as schools, churches, or arts and culture organisations also engaged with and commented on the video, making the debate even more newsworthy and relatable to many different social worlds. The video also came in conjunction with the already popular Fridays for Future protest movement initiated by Greta Thunberg. The direct relation to the European election gave it a high value of actuality. This did not stop when the official results of the election came in. Many had the subjective feeling that the Rezo video was at least partly responsible for the losses of the government parties in the election because the video had received so much attention, but there is no scientific evidence to back up this claim.

What is especially interesting is the relationship between the YouTubers and their followers and the scientific experts. Rezo and the other YouTubers never claimed to be authorities in science, but rather backed up the scientists and demanded that their voices be heard in the political debate and that the politicians from then on had to listen to the scientific experts and follow their recommendations. This is the same argument that climate change activist Greta Thunberg put forth on various occasions, 'listen to the scientists!' So in this particular instance, this specific YouTube movement had greatly amplified and supported scientific authority and expertise. However, Henriksen and Hoelting (2017, p. 34) propose that new forms of expertise emerge on platforms such as YouTube:

> The artists who find great success on YouTube are becoming a new form of expert. These experts are

> content creators who can now bypass the standard gatekeepers of genres before distributing their work. Bereiter and Scardamalia's (1993) definition of expertise notes that it is not only determined by knowledge or tenure in an area, but by how the knowledge is adapted to unique contexts and new challenges. There are still experts in traditional domains that may pose valid questions…. However, emerging and popular artists on YouTube are reframing their domain and its context of how creative systems operate and the communities that participate in them.

In this sense, professional YouTubers have become experts at being seen and heard on this specific online platform (Morcillo et al., 2019), an environment in which scientists and research organizations are struggling (e.g., Bucher et al., 2019) as well as journalists, political parties and many other organisations. The YouTubers have learnt to develop communication styles and formats that work and that are popular, they network among each other and create connections with different spheres of society. Many YouTubers make their sources transparent and link up to them in the video descriptions in order to enhance credibility and trust. They have managed to engage the community of their followers and also learnt how to deal with the platform-specific rules of YouTube and especially the curation (mainly by algorithms) that is crucial to maintain the visibility needed to survive on the platform. The success of the ethno-epistemic assemblage supporting Rezo and his video is the result of connecting and addressing various 'worlds of relevance,' the inclusion of various experts and diverse forms of expertise, but also of the development of platform-specific forms of expertise in order to reach and connect people with a variety of backgrounds and interests. This was a successful association of heterogeneous actors such as beauty, gaming, comedy, music, and other YouTube creators, with not just science and scientists but also with teachers and students, senior citizens, artists, and clergy, as well as many other members of society. This diverse group of actors managed to turn this specific ethno-epistemic assemblage into an entity embodying various forms of expertise and which was able to develop its credibility over the course of the debate, blurring the boundaries between laypeople and experts, and thus became an influential civil society actor within German political discourse.

4.2. Limitations and Outlook

A methodological limitation of this contribution is that it is based on the conceptual interpretation of selected documents and not on a systematic data collection and analysis. For instance, further research could compare the Rezo debate in various social media platforms and journalistic formats. Furthermore, it focused on only one of the evolving assemblages in the debate—the one supporting Rezo. A symmetrical account of this debate could entail studying further entities, for instancing those opposing Rezo and rejecting his claims and how they relate to each other. Another neglected aspect concerns the reception of the debate (Paßmann, 2019). Here the analysis of the hundreds of thousands of comments to the Rezo video would be an interesting starting point that could be complemented with focus groups of YouTube audiences and interviews with the actors involved in the debate. Nonetheless, the Rezo debate demonstrates, in my opinion, that YouTube as a platform and YouTubers as platform-specific experts have become crucial factors in the public science communication landscape which should be taken more seriously both by society as well as in academic discussion. Analyses of the science–society relationship should therefore also focus on the contents and various networks and associations that form around specific science-related content on YouTube and how they are publicly assessed. The investigation of controversially discussed science and health-related topics, such as climate change or COVID-19, will strongly benefit from the inclusion and consideration of these elements.

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Conflict of Interests

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References

Abidin, C., & Ots, M. (2016). Influencers tell all? Unravelling authenticity and credibility in a brand scandal. In M. Edström, A. T. Kenyon, & E.-M. Svensson (Eds.), *Blurring the lines: Market-driven and democracy-driven freedom of expression* (pp. 153–161). Gothenburg: Nordic Information Centre for Media and Communication Research.

Allgaier, J. (2018). Science and medicine on YouTube. In J. Hunsinger, L. Klastrup, M. M. Allen, & M. Mathew (Eds.), *Second international handbook of Internet research* (pp. 1–21). Wiesbaden: Springer. https://doi.org/10.1007/978-94-024-1202-4_1-1

Allgaier, J. (2019). Science and environmental communication on YouTube: Strategically distorted communications in online videos on climate change and climate engineering. *Frontiers in Communication*, *4*(36). https://doi.org/10.3389/fcomm.2019.00036

Allgaier, J., & Svalastog, A. L. (2015). The communication aspects of the Ebola virus disease outbreak in western Africa: Do we need to counter one, two, or many epidemics? *Croatian Medical Journal*, *56*(5),

496–499. https://doi.org/10.3325/cmj.2015.56.496
Arthurs, J., Drakopoulou, S., & Gandini, A. (2018). Researching YouTube. *Convergence*, *24*(1), 3–15. https://doi.org/10.1177/1354856517737222
Basch, C. H., & Basch, C. E. (2020). Emerging methods in health-related social media research: A case study of vaccine safety and YouTube. *SAGE Research Methods Cases*. https://dx.doi.org/10.4135/9781529725575
Basch, C. H., Basch, C. E., Ruggles, K. V., & Hammond, R. (2015). Coverage of the Ebola virus disease epidemic on YouTube. *Disaster Medicine & Public Health Preparedness*, *9*, 531–535.
Basch, C. H., Basch, C. E., Zybert, P., & Reeves, R. (2017). What do widely-viewed YouTube videos say about vaccines? *Child: Care, Health & Development*, *43*, 499–503.
Basch, C. H., Fung, I. C.-H., Hammond, R. N., Blankenship, E. B., Ho Tse, Z. T., Fu, K.-W., Ip, P., & Basch, C. E. (2017). Zika virus on YouTube: An analysis of English-language video content by source. *Journal of Preventive Medicine & Public Health*, *50*, 133–140. https://doi.org/10.3961/jpmph.16.107
Bishop, S. (2018). Anxiety, panic and self-optimization: Inequalities and the YouTube algorithm. *Convergence*, *24*(1), 69–84. https://doi.org/10.1177/1354856517736978
Breuer, S. (2012). Über die Bedeutung von Authentizität und Inhalt für die Glaubwürdigkeit von Webvideo-Formaten in der Wissenschaftskommunikation [About the meaning of authenticity and content for the credibility of webvideo formats in science communication]. In C. Y. Robertson-von Trotha & J. Muñoz Morcillo (Eds.), *Öffentliche Wissenschaft und Neue Medien* [Public science and new media] (pp. 101–112). Karlsruhe: KIT Scientific Publishing.
Bucher, H.-J., Boy, B., & Christ, K. (2019). Audio-Visuelle Wissenschaftsvermittlung: Eine vergleichende Rezeptionsstudie zur Ermittlung von Qualitätsstandards für Wissenschaftsfilme [Audio-visual mediation of science: A comparative reception study for investigating quality standards of science movies]. *University of Trier*. Retrieved from https://www.uni-trier.de/index.php?id=64032
CDU. (2019). Wie wir die Sache sehen [How we see things]. *CDU*. Retrieved from https://www.cdu.de/artikel/offene-antwort-rezo-wie-wir-die-sache-sehen
Delattre, V. (2017). *Quelles citations des sources chez les videastes scientifique francophones?* [What sources are quoted by French-speaking Science YouTubers?] (Master thesis). University Paris Didero, Paris, France.
Erviti, M. C., & Stengler, E. (2016). Online science videos: An exploratory study with major professional content providers in the United Kingdom. *Journal of Science Communication*, *15*(6), 1–15. https://doi.org/10.22323/2.15060206
EU election: Germany's youth wield their political power. (2019). *DW*. Retrieved from https://www.dw.com/en/eu-election-germanys-youth-wield-their-political-power/a-48910893
Flores, N. M., & de Medeiros, P. M. (2019). Science on YouTube: Legitimation stategies of Brazilian science YouTubers. *Revue Française des Sciences de L'Information et de la Communication*, *15*, 1–29.
Frühbrodt, L., & Floren, A. (2019). *Unboxing YouTube: Im Netzwerk der Profis und Profiteure* [Unboxing YouTube: In the network of professionals and profiteers]. Frankfurt: Otto Brenner Stiftung.
Geipel, A. (2018). Wissenschaft@YouTube: Plattformspezifische Formen von Wissenschaftskommunikation [Science@YouTube: Platform-specific forms of science communication]. In E. Lettkemann, R. Wilke, & H. Knoblauch (Eds.), *Knowledge in action* (pp. 137–163). Wiesbaden: Springer.
German YouTubers: Don't vote CDU or SPD or AfD. (2019). *DW*. Retrieved from https://www.dw.com/en/german-youtubers-dont-vote-cdu-or-spd-or-afd/a-48868842
Germany's AKK accused of calling for 'censorship' during election campaign. (2019). *DW*. Retrieved from https://www.dw.com/en/germanys-akk-accused-of-calling-for-censorship-during-election-campaign/a-48919475
Germany's CDU slams YouTuber Rezo over political viral video. (2019). *DW*. Retrieved from https://www.dw.com/en/germanys-cdu-slams-youtuber-rezo-over-political-viral-video/a-48839177
Henriksen, D., & Hoelting, M. (2017). Creativity on YouTube: Considering new media and the impulses of the learner. In I. Eleá & L. Mikos (Eds.), *Young and creative: Digital technologies empowering children in everyday life* (pp. 31–41). Gothenburg: Nordicom.
Holland, M. (2017). How YouTube developed into a successful platform for user-generated content. In I. Eleá & L. Mikos (Eds.), *Young and creative: Digital technologies empowering children in everyday life* (pp. 53–62). Gothenburg: Nordicom.
Irwin, A., & Michael, M. (2003). *Science, social theory and public knowledge*. Maidenhead: Open University Press.
Joul. (2020). Joul * Energiewende und Nachhaltigkeit [Energy transition and sustainability]. *YouTube*. Retrieved from https://www.youtube.com/channel/UCh2gUqiMb6QuwoX7F3kJwuw
Kim, J. (2012). The institutionalization of YouTube: From user-generated content to professionally generated content. *Media, Culture & Society*, *34*(1), 53–67.
Körkel, T., & Hoppenhaus, K. (2016). Über Web, Video und Wissenschaft [About the web, video and science]. In T. Körkel & K. Hoppenhaus (Eds.), *Web Video Wissenschaft: Ohne Bewegtbild läuft nichts mehr im Netz: Wie Wissenschaftsvideos das Publikum erobern* [Web video science: Audio visual content is everywhere on the Internet: How science videos capture audiences] (pp. 1–14). Heidelberg: Spektrum der Wissenschaft.

Kühn, A. (2020). YouTube-Star Rezo: "Wichtig ist, was die Wissenschaftler sagen!" [YouTube-star Rezo: "It is important what the scientists say"]. *Der Spiegel*. Retrieved from https://www.spiegel.de/deinspiegel/youtube-star-rezo-im-kinder-interview-wichtig-ist-was-die-wissenschaftler-sagen-a-ff183be9-115f-4487-acda-00ee60361d73

Landrum, A. R., Olshansky, A., & Richards, O. (2019). Differential susceptibility to misleading flat earth arguments on YouTube. *Media Psychology*. https://doi.org/10.1080/15213269.2019.1669461

León, B., & Bourk, M. (2018). Investigating science-related online video. In B. León & M. Bourk (Eds.), *Communicating science and technology through online video* (pp. 1–14). London: Routledge.

Limoges, C. (1993). Expert knowledge and decision-making in controversy contexts. *Public Understanding of Science*, *2*(4), 417–426.

Luzon, M.-J. (2019). Bridging the gap between experts and publics: The role of multimodality in disseminating research in online videos. *Iberica*, *37*, 167–192.

maiLab. (2019a). *Rezo wissenschaftlich geprüft* [Rezo scientifically checked] [Video file]. Retrieved from https://www.youtube.com/watch?v=tNZXy6hfvhM

maiLab. (2019b). *Klimawandel: Das ist jetzt zu tun! (feat. Rezo)* [Climate change: This what needs to be done now!] [Video file]. Retrieved from https://www.youtube.com/watch?v=4K2Pm82lBi8

maiLab. (2019c). *Bundesregierung, WTF?* [Federal Government of Germany, WTF?] [Video file]. Retrieved from https://www.youtube.com/watch?v=bwQH2IAJFr4

Medienpädagogischer Forschungsverbund Südwest. (2019). *JIM-Studie 2018: Jugend Information Medien* [JIM-study 2018, youth information media]. Stuttgart: Landesamt für Kommunikation.

Morcillo, J. M., Czurda, K., Geipel, A., & Robertson-von Trotha, C. Y. (2019). Producers of popular science web video: Between new professionalism and old gender issues. *International Journal of Marketing, Communication and New Media*, *7*(13), 72–98.

Morcillo, J. M., Czurda, K., & Robertson-von Trotha, C. Y. (2016). Typologies of the popular science web video. *Journal of Science Communication*, *15*(4), 1–32. https://doi.org/10.22323/2.15040202

Oberender, T. (2019). Die revolutionäre Kraft von 55 Minuten Youtube [The revolutionary power of 55 minutes on YouTube]. *Der Tagesspiegel*. Retrieved from https://www.tagesspiegel.de/kultur/wir-sind-rezo-die-revolutionaere-kraft-von-55-minuten-youtube/24405828.html

Oster, S. (2019). Gefährdung der Demokratie: oder ihre Veränderung? [A threat to democracy: Or its change?]. *Stefan Oster*. Retrieved from https://stefan-oster.de/gefaehrdung-der-demokratie-oder-ihre-veraenderung

Paßmann, J. (2019). Am Beispiel Rezo: Zwei Modi der Wissenspopularisierung mit Social Media [Rezo as an example: Two modes of the popularisation of science by social media]. *POP Kultur und Kritik*, *8*(2), 65–76.

Quaschning, V. (2019). Faktencheck des Teils "Die Klimakrise" der offenen Antwort der CDU an REZO vom 23.05.2019 [Fact check of the part "The Climate Crisis" of the open response by the CDU to REZO]. *Volker Quaschning*. Retrieved from https://www.volker-quaschning.de/artikel/2019-05_Stellungnahme-CDU/index.php

Rahmstorf, S. (2019). Das Rezo-Video im Faktencheck [Fact check of the Rezo video]. *Spektrum Scilogs*. Retrieved from https://scilogs.spektrum.de/klimalounge/das-rezo-video-im-faktencheck

Rat für kulturelle Bildung. (2019). *Jugend/Youtube/Kulturelle Bildung, Horizont 2019* [Youth, YouTube, cultural education, horizon 2019]. Essen: Rat für kulturelle Bildung. Retrieved from https://www.rat-kulturelle-bildung.de/fileadmin/user_upload/pdf/Studie_YouTube_Webversion_final.pdf

Reif, A., Kneisel, T., Schäfer, M., & Taddicken, M. (2020). Why are scientific experts perceived as trustworthy? Emotional assessment within TV and YouTube videos. *Media and Communication*, *8*(1), 191–205.

Rezo. (2019a). *Die Zerstörung der CDU* [The destruction of the CDU] [Video file]. Retrieved from https://www.youtube.com/watch?v=4Y1lZQsyuSQ

Rezo. (2019b). Quellen [Sources]. *Google Doc*. Retrieved from https://docs.google.com/document/d/1C0lRRQtyVAyYfn3hh9SDzTbjrtPhNlewVUPOL_WCBOs/edit

Rezo. (2019c). *Ein Statement von 90+ YouTubern* [A statement of 90+ YouTubers] [Video file]. Retrieved from https://www.youtube.com/watch?v=Xpg84NjCr9c

Rezo. [rezomusik]. (2019d, May 22). Mich erreichen in den letzten Tagen so viele Nachrichten von Lehrern und Schülern, die gemeinsam in der Schule das Video gucken und darüber diskutieren [In the last days I received so many messages from teachers and pupils/students who were watching the video in school and discussing it] [Tweet]. Retrieved from https://twitter.com/rezomusik/status/1131147172207058946

Rieder, B., Matamoros-Fernandez, A., & Coromina, O. (2018). From ranking algorithms to 'ranking cultures': Investigating the modulation of visibility in YouTube search results. *Convergence*, *24*, 50–68.

Rihl, A., & Wegener, C. (2019). YouTube celebrities and parasocial interaction: Using feedback channels in mediatized relationships. *Convergence*, *25*(3), 554–566.

Sampson, T. D., Maddison, S., & Ellis, D. (Eds.). (2018). *Affect and social media: Emotion, mediation, anxiety and contagion*. Jefferson, NC: McFarland.

Scientists for Future. (2019). Statement of scientists and scholars concerning the protests for more climate protection. *Scientists4Future*. Retrieved from https://www.scientists4future.org/stellungnahme/statement-text

Singer, T. (2020). Warum der Nannen-Preis für den Youtuber Rezo ein Fehler ist [Why awarding the Nannen-Award to the YouTuber Rezo is a mistake]. *Meedia*. Retrieved from https://meedia.de/2020/05/04/kommentar-warum-der-nannen-preis-fuer-den-youtuber-rezo-ein-fehler-ist

Stojanovski, F. (2019). 'We are not bots!' In Berlin, thousands protest proposed EU regulation on Internet upload filters. *Global Voices*. Retrieved from https://globalvoices.org/2019/03/06/we-are-not-bots-in-berlin-thousands-protest-proposed-eu-regulation-on-Internet-upload-filters

Tagesschau. (2019). Umgang mit Rezo-Video: "Zu abwehrend": Merkel kritisiert CDU [Dealing with the Rezo video: "Too defensive": Merkel is criticizing CDU]. *Tagesschau*. Retrieved from https://www.tagesschau.de/inland/merkel-zu-rezo-101.html

Thomsen, C. (2019). Rezo zitiert sauberer als so mancher Bundesminister [Rezo is citing references more precisely than some federal ministers]. *Tagesspiegel*. Retrieved from https://www.tagesspiegel.de/wissen/tu-praesident-unterstuetzt-video-des-youtubers-rezo-zitiert-sauberer-als-so-mancher-bundesminister/24383156.html

Van Es, K. (2019). YouTube's operational logic: "The view" as pervasive category. *Television New Media*, *21*(3), 223–239.

Venkatraman, A., Garg, N., & Kumar, N. (2015). Greater freedom of speech on Web 2.0 correlates with dominance of views linking vaccines to autism. *Vaccine*, *33*, 1422–1425.

Welbourne, D., & Grant, W. J. (2016). Science communication on YouTube: Factors that affect channel and video popularity. *Public Understanding of Science*, *25*(6), 706–718. https://doi.org/10.1177/0963662515572068

Wikipedia. (2020a). Rezo. *Wikipedia*. Retrieved from https://de.wikipedia.org/wiki/Rezo

Wikipedia. (2020b). Die Zerstörung der CDU [The destruction of the CDU]. *Wikipedia*. Retrieved from https://de.wikipedia.org/wiki/Die_Zerst%C3%B6rung_der_CDU

Wissenschaft im Dialog. (2015). Wissenschaftsbaromter 2015 [Sciencebarometer 2015]. *Wissenschaft im Dialog gGmbH*. Retrieved from https://www.wissenschaft-im-dialog.de/projekte/wissenschaftsbarometer/wissenschaftsbarometer-2015

YouTubers petition for free speech after AKK criticism. (2019). *DW*. Retrieved from https://www.dw.com/en/youtubers-petition-for-free-speech-after-akk-criticism/a-48944675

Ziewiecki, S., & Schwemmer, C. (2019). Die Vernetzung von Influencern: Eine Analyse der deutschen YouTube-Szene [Networks of influencers: An analysis of the German YouTube scene]. *Merz Wissenschaft*, *63*(6), 18–28.

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